ZooKeys 1249: 1–13 (2025)
DOI: 10.3897/zookeys.1249.159081

Research Article

Different, but still the same: integrative taxonomy confirms a new species of *Eresus* Walckenaer, 1805 (Araneae, Eresidae) from the South Caucasus

Alireza Zamani[1], Armen Seropian[2], Noushig Zarikian[3], Natalia Bulbulashvili[4], Tamás Szűts[5]

1 *Department of Biology, University of Turku, Turku, Finland*
2 *Caucasus Leibniz Biodiversity Research Center (LBiC), Ilia State University, 3/5 Cholokashvili Ave., Tbilisi 0179, Georgia.*
3 *Scientific Center of Zoology and Hydroecology, National Academy of Sciences, Yerevan, Armenia*
4 *Rustaveli st. 9, 1400, Gori, Georgia*
5 *Department of Zoology, University of Veterinary Medicine Budapest, Budapest, Hungary*

Corresponding author: Noushig Zarikian (noushigz@hotmail.com)

Abstract

This study represents the first step toward a systematic revision of the velvet spider genus *Eresus* Walckenaer, 1805 in the Caucasus. Here, *Eresus transcaucasicus* sp. nov. is described using an integrative approach, based on male specimens collected from the South Caucasus. The species was previously reported as *E. kollari* Rossi, 1846 from Armenia and as *Eresus* sp. from Georgia. Intraspecific variations in both coloration patterns and conductor shape, which have been rarely documented in this genus, are illustrated. The validity of previous records of *E. kollari* in the region is discussed.

Key words: Biodiversity hotspot, integrative taxonomy, ladybird spiders, Transcaucasia

OPEN ACCESS

Academic editor: Shuqiang Li
Received: 15 May 2025
Accepted: 15 June 2025
Published: 12 August 2025

ZooBank: https://zoobank.org/3E07A24B-7A75-4EFE-89C5-5E72AC0EAC43

Citation: Zamani A, Seropian A, Zarikian N, Bulbulashvili N, Szűts T (2025) Different, but still the same: integrative taxonomy confirms a new species of *Eresus* Walckenaer, 1805 (Araneae, Eresidae) from the South Caucasus. ZooKeys 1249: 1–13. https://doi.org/10.3897/zookeys.1249.159081

Copyright: © Alireza Zamani et al.
This is an open access article distributed under terms of the Creative Commons Attribution License (Attribution 4.0 International – CC BY 4.0).

Introduction

Eresidae C.L. Koch, 1845 is a relatively small family of spiders, currently comprising 116 valid species in nine genera and two subfamilies. Commonly known as velvet spiders, they are primarily distributed throughout the Palaearctic and Afrotropical regions. A few species of *Stegodyphus* Simon, 1873 occur in the Oriental region, and one species, *S. manaus* Kraus & Kraus, 1992, is known from Brazil (WSC 2025; Zamani et al. 2025).

The type genus, *Eresus* Walckenaer, 1805, consists of 32 accepted species and five subspecies distributed from the Mediterranean Basin to Korea and the Russian Far East (WSC 2025; Zamani et al. 2025). Males of most *Eresus* species exhibit vibrant coloration patterns, earning them the common name "ladybird spiders." The taxonomy and diversity of *Eresus* remain poorly explored across much of its range. Seventeen species have been described in the 21st century, six based solely on morphological characteristics (Zamani et al. 2020; Lin et al. 2021; Řezáč et al. 2023; Al-Yacoub et al. 2025; Lecigne et al. 2025) and eleven using an integrative approach (Řezáč et al. 2008; Kovács et al. 2015; Lin

et al. 2022; Zamani et al. 2025). The latter approach is particularly important given the high degree of interspecific uniformity in the copulatory structures within the genus.

The Caucasus, with the highest biodiversity of any temperate forest region worldwide and one of two biodiversity hotspots in West Asia (Zazanashvili and Mallon 2009), remains particularly understudied regarding the diversity of ladybird spiders. Currently, only three *Eresus* species are known from this region (Otto 2022; Mikhailov 2024): *E. kollari* Rossi, 1846, the most widely distributed species of the genus, at least based on the current state of knowledge; *E. lavrosii* Mcheidze, 1997, a black-and-white-colored species known from Georgia (Mcheidze 1997; Seropian et al. 2025), Turkey (Zamani et al. 2020; Kara et al. 2025), Armenia (Kalashian et al. 2023; Zarikian et al. 2023), and Azerbaijan (Seropian et al. 2025); and an unidentified species from Georgia that could not be matched with any known species based on either COI barcode sequences or morphology (Seropian et al. 2023).

The present study represents the first step toward a systematic revision of *Eresus* in the Caucasus. Here, we describe a new species that was initially reported as *E. kollari* from Armenia by Zarikian (2022) and as *Eresus* sp. from Georgia by Seropian et al. (2023), using an integrative approach and based on material collected from both countries.

Materials and methods

Morphological examination and the map

The Armenian specimens (Figs 1A–C, 2A–D, 3A, B) were examined at the Department of Zoology, University of Veterinary Medicine Budapest (Hungary), with the left palp detached and setae shaved off using a lancet. Specimens were fixed in position on sand for acquiring the habitus images, and in commercial hand sanitizer for the palp images. Multifocal images were compiled using Helicon Focus 7.0, licensed to TS. Stack images of different focal planes for the habitus were captured using a Tucsen MiChrome digital camera attached to a Nikon SMZ1000 stereomicroscope, while palp images were taken by a Tucsen TrueChrome Metrics digital camera on a Nikon Eclipse E200 compound microscope. The Georgian specimens (Figs 1D–F, 3C–F, 4A–L) were examined at the Institute of Ecology, Ilia State University (Georgia), using a Zeiss Stemi 508 Stereo Microscope with 8:1 Zoom and a Zeiss Apo 1.5× FWD 53 mm front lens attached. Drawings were made based on multifocal microscope photographs stacked in Zerene Stacker 1.04, using a Wacom CTH-690 Intuos Medium Pen and Touch Tablet with the programs Krita v. 2.9.7 and Photoshop CS6 v. 13.0 licensed to AS. Drawings show the left palp. All measurements are provided in millimeters and were taken from images. Leg segments were measured on the dorsal side and are listed as: total (femur, patella, tibia, metatarsus, tarsus). The distribution map (Fig. 6) was created using SimpleMappr (Shorthouse 2010).

Depositories

HNHM Hungarian Natural History Museum, Budapest, Hungary (E. Lazányi);

ISU Ilia State University, Tbilisi, Georgia;
ZMUT Zoological Museum of the University of Turku, Turku, Finland (V. Vahtera).

Molecular procedures, phylogenetic analysis, and species delimitation

DNA from the Armenian specimens was extracted from a single leg using standard extraction kits. PCR amplification was conducted at the Department of Zoology, University of Veterinary Medicine Budapest, using the LCO1490/HCO2198 primers (Folmer et al. 1994). Capillary electrophoresis was performed with an ABI 3500xL sequencer (Applied Biosystems, Foster City, CA, USA) through the commercial services of Biomi (Gödöllő, Hungary).

DNA extraction from the Georgian specimens at ISU followed a customized protocol (Seropian et al. 2023). The extracted DNA and remaining specimen material were deposited in the scientific collections of ISU, and the resulting sequences were submitted to the Barcode of Life Data Systems (BOLD) database.

Phylogenetic analysis was conducted using IQ-TREE 2.0 (Minh et al. 2020) with the command "-m TESTNEW -bb 1000 -alrt 1000." The resulting tree was edited in FigTree (Rambaut 2018).

Species delimitations were performed using various methods: ABGD (Puillandre et al. 2012), ASAP (Puillandre et al. 2021), and PTP (Zhang et al. 2013). The results were saved in SPART format (Miralles et al. 2022) and compared using LIMES (Ducasse et al. 2020).

Results

The phylogenetic analysis resulted in a tree (Fig. 5) that is mostly congruent with that of Zamani et al. (2025), with one exception: *E. surena* Zamani & Szűts, 2025 is placed basal in the *sandaliatus* group instead of sister to the group consisting of *E. sandaliatus* (Martini & Goeze, 1778) and *E. hermani* Kovács, Prazsák, Eichardt, Vári & Gyurkovics, 2015. *Eresus transcaucasicus* sp. nov. is placed sister to a clade comprising *E. robin* Zamani & Szűts, 2025 and *Eresus* sp. from Batman, Turkey.

Among the species delimitation methods, the ASAP (Assemble Species by Automatic Partitioning) analysis under both the K80 and Jukes-Cantor substitution models produced the same groupings with the lowest ASAP score. This was identical to the ABGD delimitation of 23 species. Alternative groupings based on suboptimal ASAP scores ranged from 22 to 29 species (see Fig. 5B for details). However, in all these groupings, the four representatives of *Eresus transcaucasicus* sp. nov. were consistently treated as a single species.

Among the twelve groupings generated by the four delimitation methods, eleven recovered the four vouchers of *E. transcaucasicus* sp. nov. as a single species. The exception was PTP, which included it within a larger cluster of species of the *sandaliatus* group (i.e., *E. hermani*; *E. robin*; *E. sandaliatus*; *E. sparabara* Zamani & Szűts, 2025; *E. surena*; *Eresus* sp.). These results support the conspecificity of specimens from the two geographically distant localities in Armenia and Georgia. For details see Suppl. material 1.

Taxonomy

Family Eresidae C.L. Koch, 1845

Genus *Eresus* Walckenaer, 1805

Type species. *Aranea cinnaberina* Olivier, 1789; by subsequent designation (Thorell 1870: 200).

Eresus transcaucasicus sp. nov.

https://zoobank.org/9613F024-904B-4F8E-9102-8EFCB62F4A76
Figs 1A–F, 2A–D, 3A–F, 4A–L

Eresus kollari: Zarikian 2022: 759, fig. 1 (♂).
Eresus sp.: Seropian et al. 2023: 237, fig. S1 (♂).

Type material. ***Holotype*** • ♂ (ZMUT 1017, SAJ366): ARMENIA: Aragatsotn Province: Ara Mountains, 40°23'N, 44°28'E, 1770 m, 03.11.2022, leg. N. Zarikian.

Figure 1. Habitus of the male holotype (**B.** ZMUT 1017, from Armenia) and paratypes (**A, C.** HNHM 11678 and ZMUT 1018, from Armenia; **D–F.** ISU-CaBOL 1009989, 1009988, 1018701, from Georgia) of *Eresus transcaucasicus* sp. nov., dorsal view. Scale bars: 4 mm.

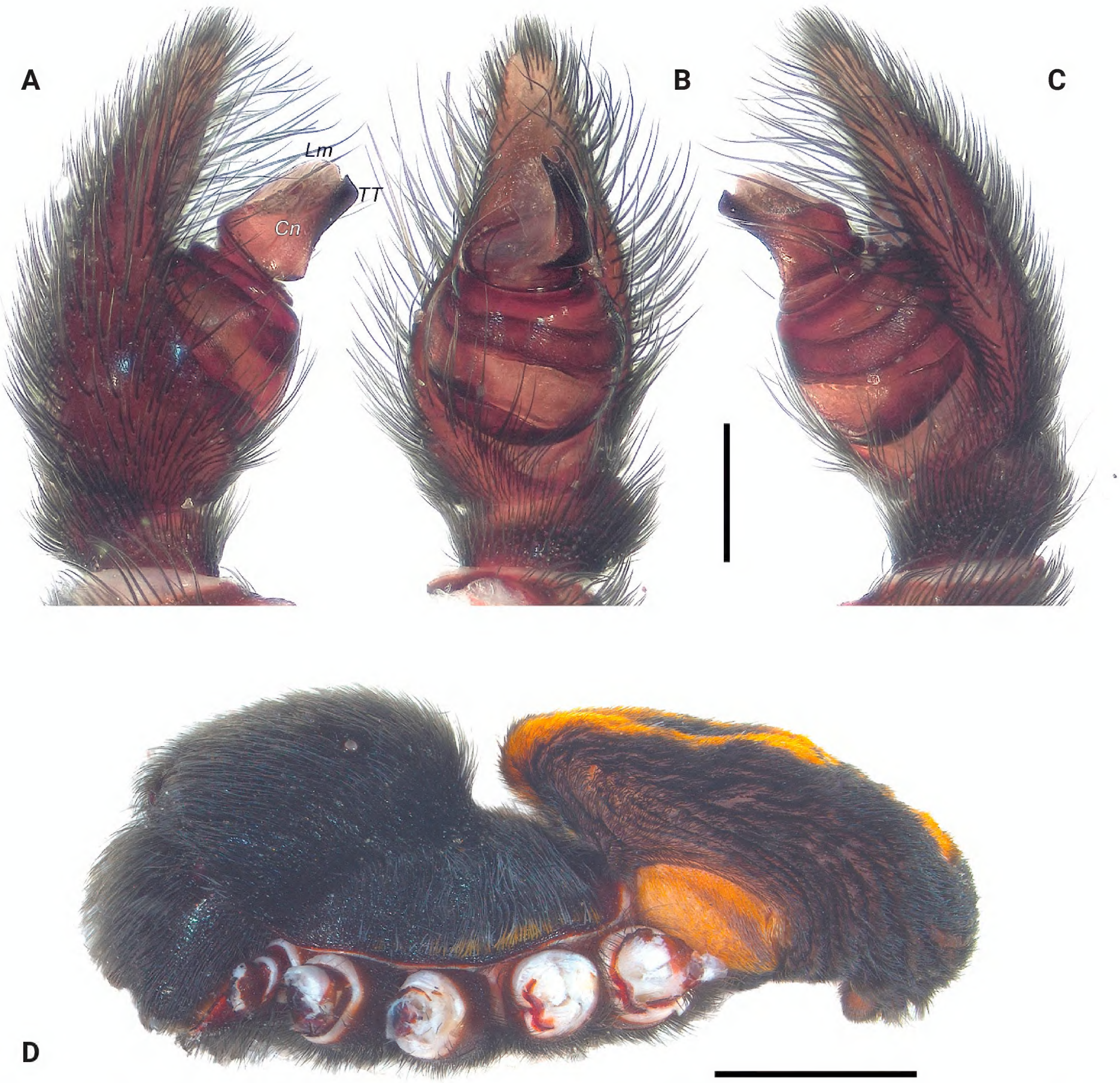

Figure 2. Palp (**A–C**) and habitus (**D**) of the male holotype (ZMUT 1017, from Armenia) of *Eresus transcaucasicus* sp. nov. **A.** Prolateral view; **B.** Ventral view; **C.** Retrolateral view; **D.** Lateral view. Abbreviations: Cn – conductor, Lm – lamella, TT – terminal tooth. Scale bars: 0.4 mm (**A–C**), 4 mm (**D**).

***Paratypes*:** • 5♂ (ZMUT 1018, HNHM 11678, HNHM 11448, HNHM 11589, HNHM 11491), collected with the holotype; • 2♂ (ISU; CaBOL-IDs 1018700, 1018701): GEORGIA: Shida Qartli Region: Gori, path to Tsedisi Fortress, steppe, 41°58'02.6"N, 44°05'54.2"E, 850 m, 23.10.2021, leg. A. Seropian, N. Bulbulashvili; • 1♂ (ISU; CaBOL-ID 1009989): Gori, steppe, 41°58'31.1"N, 44°06'03.6"E, 600 m, 25.09.2024, leg. N. Bulbulashvili; • 1♂ (ISU; CaBOL-ID 1009988): Tbilisi: Dighomi village, heathland, 41°46'49.8"N, 44°42'14.0"E, 667 m, 28.09.2024, leg. A. Seropian, N. Bulbulashvili.

Diagnosis. The new species belongs to the *sandaliatus* group sensu Zamani et al. (2025). In the overall shape of the conductor (Cn) and the general coloration pattern of the body and appendages, it most closely resembles *E. kollari* and *E. hermani*. It can be distinguished from *E. kollari* by its more robust terminal tooth (TT)

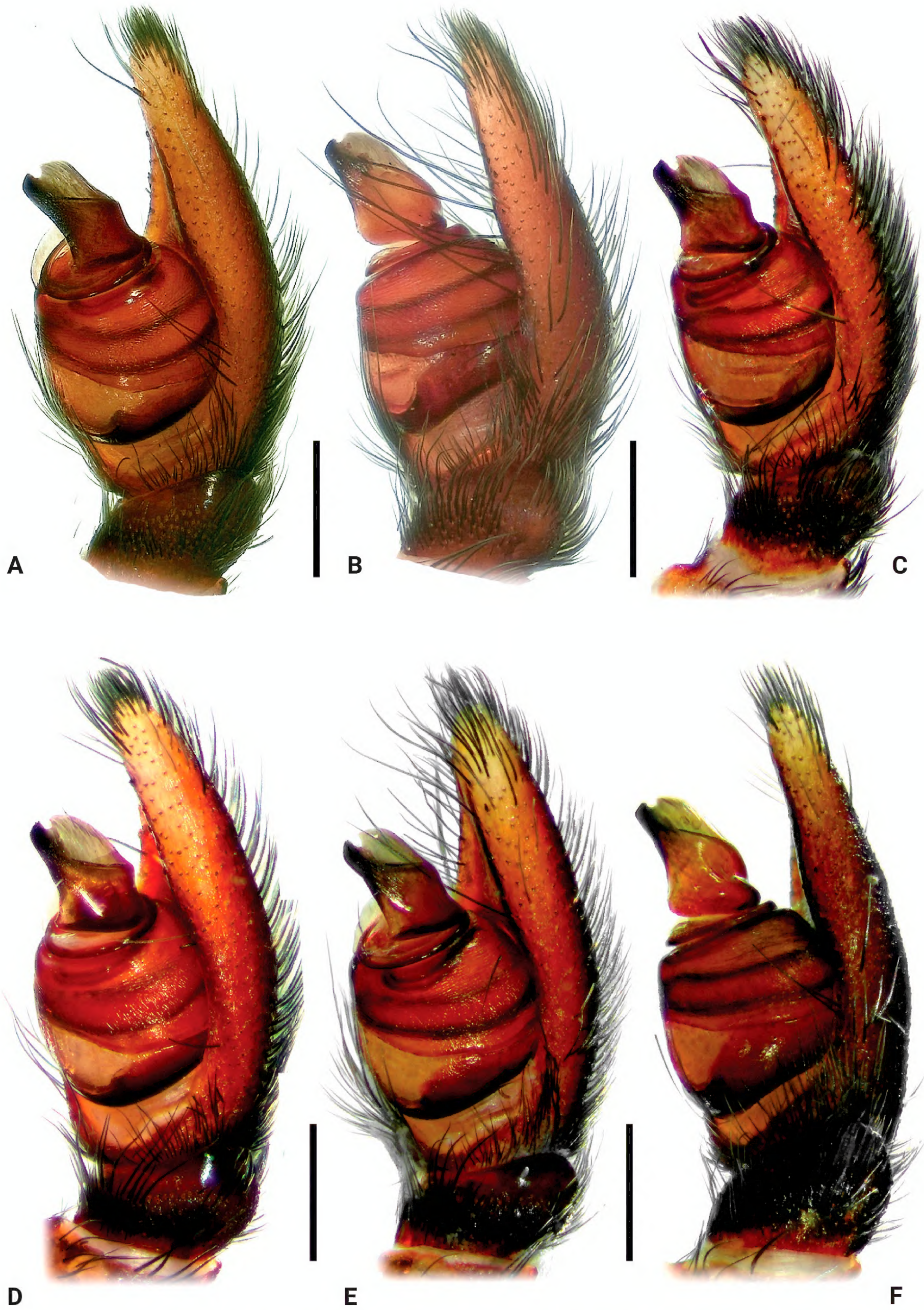

Figure 3. Palps of the male paratypes of *Eresus transcaucasicus* sp. nov., retrolateral view. **A, B.** HNHM 11448 and HNHM 11678, respectively, from Armenia; **C–F.** ISU-CaBOL 1009988, 1009989, 1018701, 1018700, respectively, from Georgia. Scale bars: 0.4 mm.

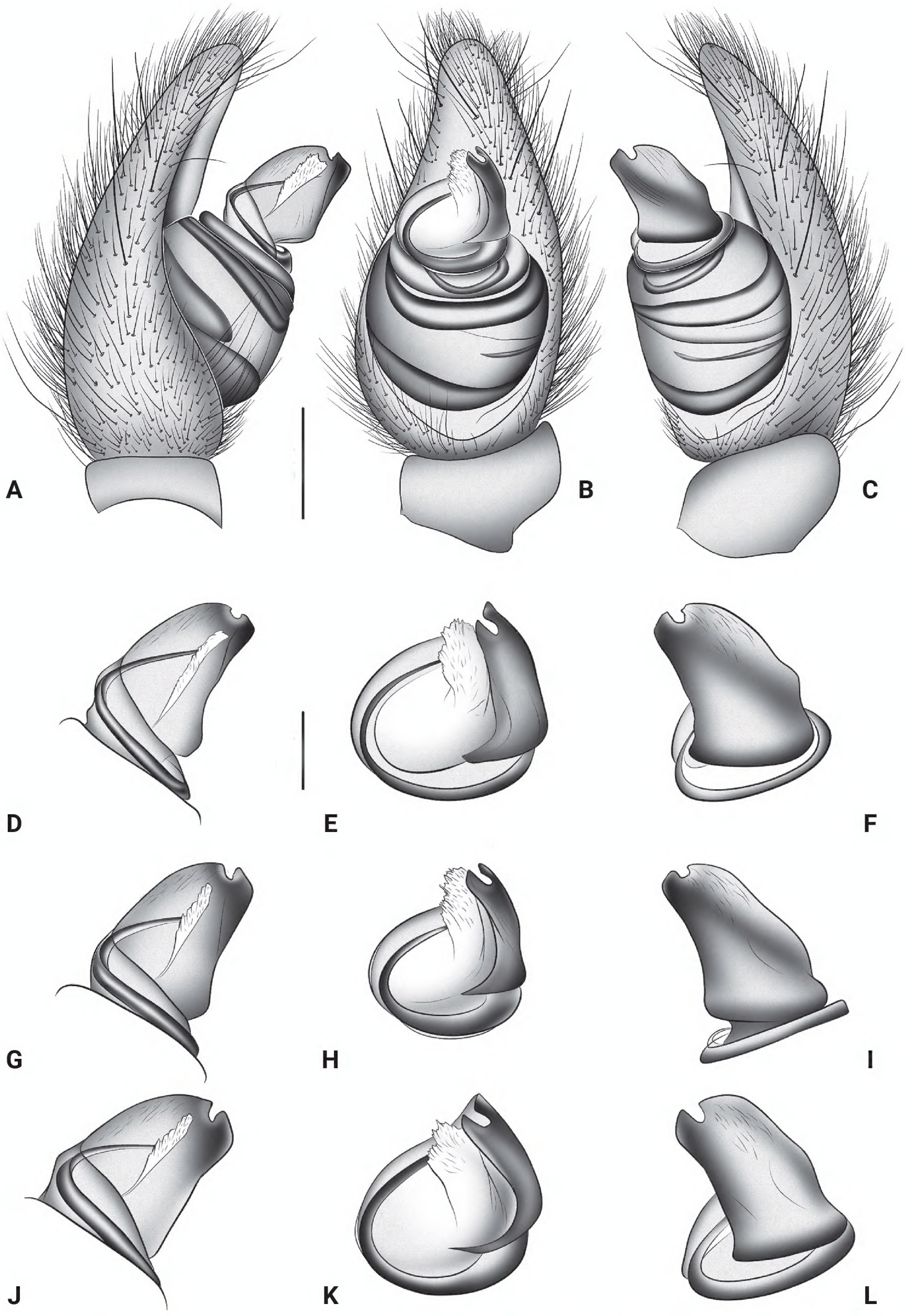

Figure 4. Palps of the male paratypes (**A–C.** ISU-CaBOL 1009988; **D–F.** ISU-CaBOL 1009989; **G–I.** ISU-CaBOL 1018700; **J–L.** ISU-CaBOL 1018701) of *Eresus transcaucasicus* sp. nov. from Georgia. **A–C.** Tibia, cymbium and bulb, prolateral, ventral and retrolateral views; **D, G, J.** Embolic division, prolateral view; **E, H, K.** Same, ventral view; **F, I, L.** Same, retrolateral view. Scale bars: 0.4 mm (**A–C**), 0.1 mm (**D–L**).

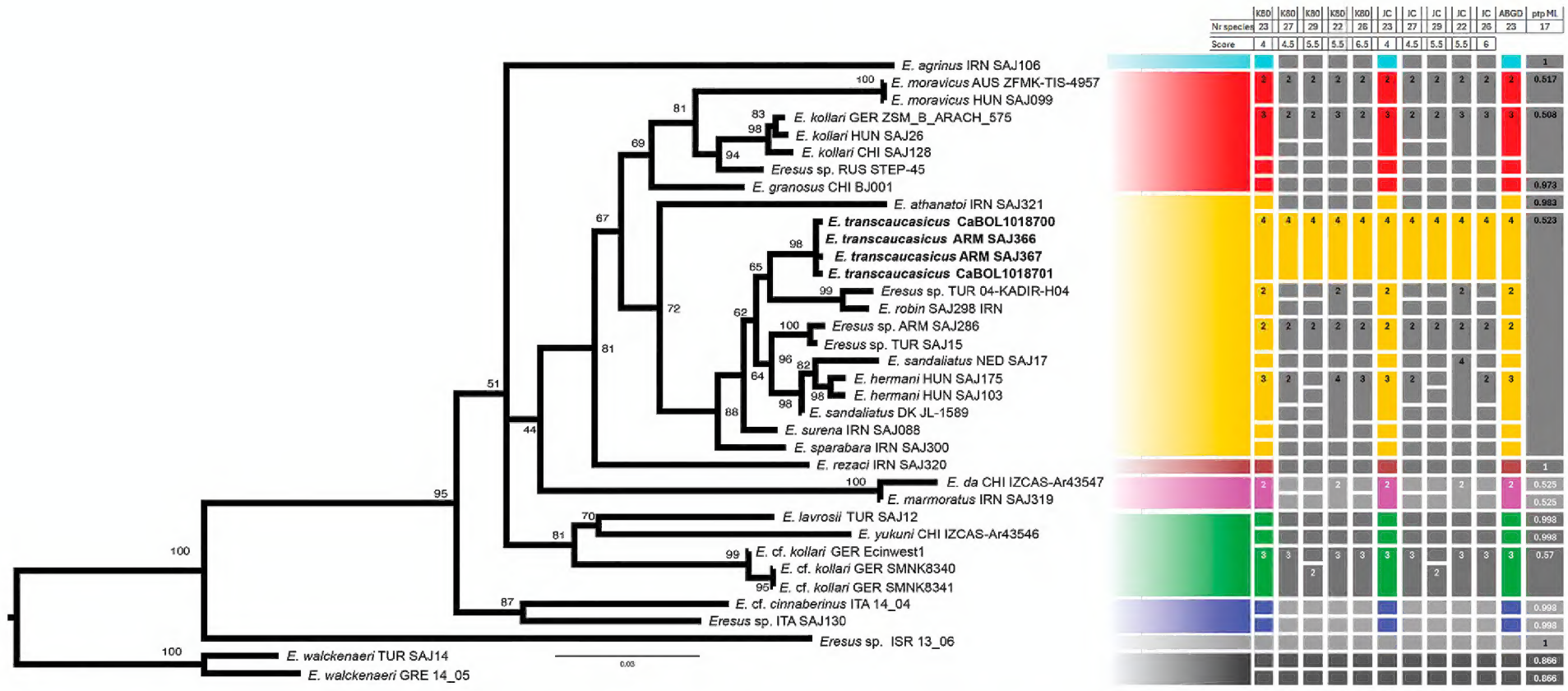

Figure 5. Phylogenetic and species delimitation results, based on the COI dataset: the maximum likelihood phylogram, along with the results of various species delimitation methods. Taxon names in bold represent the new species described here. Morphology-based species concepts are indicated by their respective Latin names. Each horizontal bar represents a putative species as inferred by a molecular method. The preferred delimitation results are highlighted in color, others are in grayscale. Different colors correspond to recognized species groups as explained in Zamani et al. (2025).

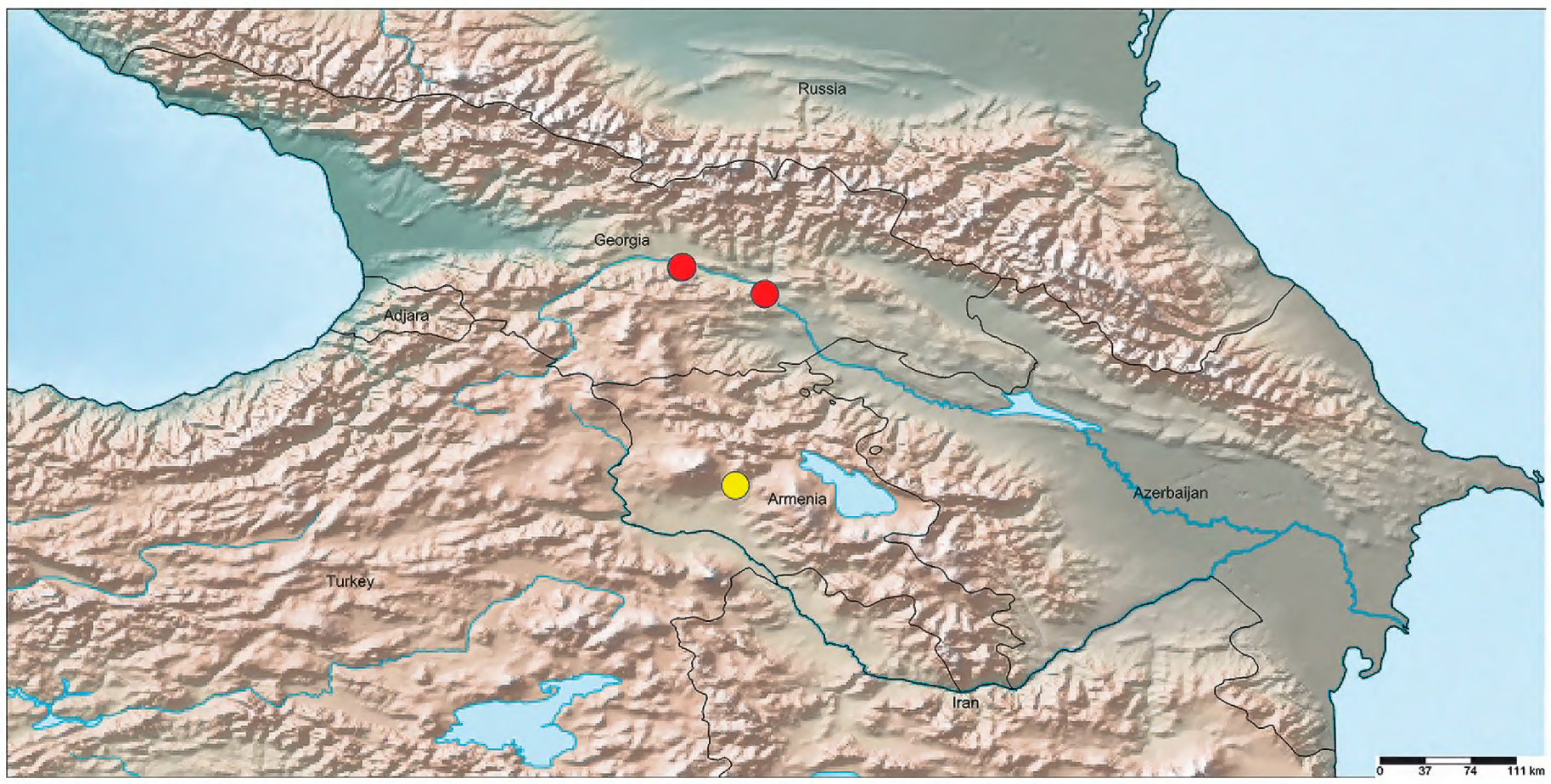

Figure 6. Collection localities of the type material of *Eresus transcaucasicus* sp. nov. The yellow circle indicates the type locality in Armenia; the red circles indicate the collection localities of the paratypes from Georgia.

having a distinct bulge (Figs 2C, F, I, L, 3C, F cf. Miller et al. 2012: fig. 43J). From *E. hermani*, it differs in the conductor distinctly longer than wide in retrolateral view (*vs*. almost as long as wide; Figs 2C, F, I, L, 3C, F cf. Kovács et al. 2015: fig. 3B).

Description. ***Male*** (holotype). Habitus as in Figs 1B, 2D. Total length 8.21; carapace 4.68 long, 3.21 wide, 2.50 high; abdomen 4.78 long, 3.76 wide. Carapace and chelicerae dark brown, almost black, densely coated with black setae; pars cephalica elevated, covered with black setae; pars thoracica with sparse white setae, margins with few orange setae. Palpal segments without white setae; femur, patella and tibia densely covered with dark setae of black or grey

tone. Legs I and II densely coated with black setae, with rings of white setae on proximal and distal joints of segments; legs III and IV coated with red setae coverage; distal end of tibiae and metatarsi with white ring of setae. Abdomen black on sides, anterior part of dorsum and posterior to epigastric fold; dorsum red, with two pairs of large and one pair of small black dots; venter anterior to epigastric fold red; booklung covers with short red setae. Measurements of leg segments: I: 9.02 (2.89, 1.45, 1.51, 1.86, 1.31); II: 7.75 (2.45, 1.37, 1.31, 1.53, 1.09); III: 6.60 (2.19, 1.23, 1.06, 1.30, 0.82); IV: 9.09 (2.82, 1.62, 1.85, 1.72, 1.08).

Palp as in Fig. 2A–C; conductor (Cn) distinctly longer than wide; terminal tooth (TT) well-developed and robust, slightly bulging, subequal to lamella (Lm), with smooth transition to base of conductor in lateral view; lamella >2× longer than high; lamellar groove shallow.

Variation (n = 5). Habitus of paratypes from Armenia as in Fig. 1A, C, and from Georgia as in Fig. 1D–F. Measurements: total length 8.21–8.92; carapace length 4.68–4.72, width 3.21–3.35. Sparse white setae may be present at black spots around sigilla (Fig. 1D–F). Palp of paratypes from Armenia as in Fig. 3A, B, and from Georgia as in Figs 3C–F, 4A–L. Conductor: length/width ratio: 1.2–1.5; very slight shoulder present in some specimens (Figs 2C, 4C, F); depth of lamellar groove slightly varying (Figs 3A–F, 4C, F, I, L).

***Female*.** Unknown.

Habitat. The specimens were collected under stones and on the ground in warm, dry mountain slopes with sparse vegetation.

Phenology. Early to late autumn.

Distribution. Known only from the listed localities in Lesser Caucasus Mountains in Armenia and Georgia (Fig. 5).

Etymology. The specific epithet refers to the distribution of the species in the South Caucasus, also known as Transcaucasia.

Discussion

Traditionally, *Eresus* species have been separated based on coloration and/or characters of the copulatory organs. The former's usefulness for species delimitation "is constrained by its intraspecific variability," whereas the latter exhibits a "high degree of shape uniformity" and is therefore considered "not as useful for discrimination" (Řezáč et al. 2008: 280, 267). Here, we introduce DNA barcoding as a new line of evidence for species delimitation and demonstrate a high degree of intraspecific color variation (Fig. 1), a factor rarely tested in taxonomic studies. Regarding palpal characters, we also illustrate considerable intraspecific variation (Figs 2–4), in contrast to the conclusions of Řezáč et al. (2008).

However, we must also note two important considerations. First, our species delimitation was based on a single maternally inherited gene, which has its limitations (Dellicour and Flot 2018). Second, our dataset included many singletons, which may affect the resulting groupings. Nonetheless, we firmly believe that such exploratory work will facilitate further integrative research on this genus.

The reproductive periods, and consequently the surface activity of males, are phenologically separated among *Eresus* species. Broadly, they can be categorized into two groups: spring-early summer and late summer-autumn, with the latter including the species newly described herein. Based on previous records from the Caucasus (Azerbaijan, Dagestan, and Georgia; Otto 2022), it is likely that at least

one additional species belonging to the *sandaliatus* group exists in the region, phenologically distinct from the one described here, as nearly all mature males have been collected in spring or early summer. Unfortunately, almost none of the authors have provided diagnostic drawings or photographs of the copulatory organs. Mcheidze (1997) reported several locations for *E. kollari* in Georgia (Shiraki, Kasristskali, Vashlovani Reserve); however, the absence of collection data and the poor quality of illustrations prevent a definitive assignment of these records to a particular group. Similarly, records of this species from Azerbaijan by Dunin (1984, 1988; as *E. niger* (Petagna, 1787)) and Marusik et al. (2005; as *E. cinnaberinus* (Olivier, 1789)) were considered doubtful by Marusik et al. (2005: 138): "Judging from the vulva, our specimen may belong to another sibling species".

Acknowledgments

We are very grateful to Krisztián Szabó (Budapest, Hungary) for providing the sequences of the Armenian specimens and assisting with the molecular analyses.

Additional information

Conflict of interest

The authors have declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Use of AI

No use of AI was reported.

Funding

The research was supported by the Higher Education and Science Committee of MESCS RA (research project no. 24WS-1F017) and the strategic research fund of the University of Veterinary Medicine Budapest (grant no. SRF-002). The research of Armen Seropian and Natalia Bulbulashvili was partly supported by the Caucasus Barcode of Life (CaBOL) project funded by the Federal Ministry of Education and Research (grant no. 01DK20014A).

Author contributions

Conceptualization: AZ, TS. Data curation: AS. Formal analysis: TS. Funding acquisition: NZ. Investigation: NZ, NB, AS. Methodology: TS. Visualization: TS, AS. Writing – original draft: TS, AZ. Writing – review and editing: AS.

Author ORCIDs

Alireza Zamani https://orcid.org/0000-0002-8084-9666
Armen Seropian https://orcid.org/0000-0003-3777-9954
Noushig Zarikian https://orcid.org/0000-0001-8334-8413
Tamás Szűts https://orcid.org/0000-0001-8954-0641

Data availability

All of the data that support the findings of this study are available in the main text or Supplementary Information.

References

Al-Yacoub GAA, Al-Budeiri ASM, Zamani A (2025) A new species of *Eresus* Walckenaer, 1805 (Araneae: Eresidae) from Iraq. Arachnology 20(1): 31–33. https://doi.org/10.13156/arac.2024.20.1.31

Dellicour S, Flot F (2018) The hitchhiker's guide to single-locus species delimitation. Molecular Ecology Resources 18(6): 1234–1246. https://doi.org/10.1111/1755-0998.12908

Ducasse J, Ung V, Lecointre G, Miralles A (2020) LIMES a tool for comparing species partition. Bioinformatics 36(7): 2282–2283. https://doi.org/10.1093/bioinformatics/btz911

Folmer O, Black M, Hoeh W, Lutz R, Vrijenhoek R (1994) DNA primers for amplification of mitochondrial cytochrome c oxidase subunit I from diverse metazoan invertebrates. Molecular Marine Biology and Biotechnology 3(5): 294–299. PMID: 7881515.

Kalashian M, Aghababyan K, Zarikian N, Gabrielyan B, Arakelyan M, Ghazaryan A (2023) Fauna of Armenia. In: Fayvush G (Ed.) Biodiversity of Armenia. Springer Nature Switzerland AG, Cham, 165–282. https://doi.org/10.1007/978-3-031-34332-2_5

Kara C, Demir H, Seyyar O (2025) New locality record of *Eresus lavrosii* Mcheidze, 1997 (Araneae: Eresidae) in Anatolia. Serket 20(4): 435–438.

Kovács G, Prazsák I, Eichardt J, Vári G, Gyurkovics H (2015) A new ladybird spider from Hungary (Araneae, Eresidae). ZooKeys 494: 13–30. https://doi.org/10.3897/zookeys.494.8676

Lecigne S, Moutaouakil S, Lips J (2025) Contribution to the knowledge of the spider fauna of Morocco (Arachnida: Araneae) – second note. On new species and new records from caves and miscellaneous terrestrial ecosystems. Journal of the Belgian Arachnological Society 40(1, supplement): 1–184. https://doi.org/10.30963/aramit6607

Lin YJ, Marusik YM, Gao CX, Xu H, Zhang XQ, Wang ZY, Zhu WH, Li SQ (2021) Twenty-three new spider species (Arachnida: Araneae) from Asia. Zoological Systematics 46(2): 91–152. https://doi.org/10.11865/zs.2021201

Lin YJ, Li SQ, Zhao X, Chen ZQ, Chen HF (2022) Two new *Eresus* species (Araneae, Eresidae) from Xinjiang, China. Biodiversity Data Journal 10: e94853. https://doi.org/10.3897/BDJ.10.e94853

Marusik YM, Guseinov E, Aliev HA (2005) Spiders (Arachnida: Aranei) of Azerbaijan 4. Fauna of Naxçivan. Arthropoda Selecta 13(3, for 2004): 135–149.

Mcheidze TS (1997) Spiders of Georgia: Systematics, Ecology, Zoogeographic Review. Tbilisi University, Tbilisi, 390 pp. [in Georgian]

Mikhailov KG (2024) Checklist of Spiders (Arachnida: Aranei) of Russia and Neighbouring Countries (as of 2022). Arthropoda Selecta. Supplement No. 7. 2024. KMK Scientific Press, Moscow, 311 pp.

Miller JA, Griswold CE, Scharff N, Řezáč M, Szűts T, Marhabaie M (2012) The velvet spiders: An atlas of the Eresidae (Arachnida, Araneae). ZooKeys 195: 1–144. https://doi.org/10.3897/zookeys.195.2342

Minh BQ, Schmidt HA, Chernomor O, Schrempf D, Woodhams MD, von Haeseler A, Lanfear R (2020) IQ-TREE 2: New Models and Efficient Methods for Phylogenetic Inference in the Genomic Era. Molecular Biology and Evolution 37(5): 1530–1534. https://doi.org/10.1093/molbev/msaa015

Miralles A, Ducasse J, Brouillet S, Flouri T, Fujisawa T, Kapli P, Puillandre N (2022) SPART: A versatile and standardized data exchange format for species partition information. Molecular Ecology Resources 22(1): 430–438. https://doi.org/10.1111/1755-0998.13470

Otto S (2022) Caucasian Spiders. A faunistic database on the spiders of the Caucasus. Version 02.2022. https://caucasus-spiders.info/

Puillandre N, Lambert A, Brouillet S, Achaz G (2012) ABGD, Automatic Barcode Gap Discovery for primary species delimitation. Molecular Ecology 21(8): 1864–1877. https://doi.org/10.1111/j.1365-294X.2011.05239.x

Puillandre N, Brouillet S, Achaz G (2021) ASAP: Assemble species by automatic partitioning. Molecular Ecology Resources 21(2): 609–620. https://doi.org/10.1111/1755-0998.13281

Rambaut A (2018) Figtree ver 1.4.4. Institute of Evolutionary Biology, University of Edinburgh, Edinburgh. http://tree.bio.ed.ac.uk/software/gtree

Řezáč M, Pekár S, Johannesen J (2008) Taxonomic review and phylogenetic analysis of Central European *Eresus* species (Araneae: Eresidae). Zoologica Scripta 37(3): 263–287. https://doi.org/10.1111/j.1463-6409.2008.00328.x

Řezáč M, Vaněk O, Střeštík V (2023) *Eresus elhennawyi* sp. n. (Araneae: Eresidae), a new velvet spider mimicking mutilid wasps from north-western Africa. Serket 19(3): 340–354.

Seropian A, Bulbulashvili N, Otto S, Krammer HJ, Kachlishvili N, Datunashvili A (2023) Picking pearls from the Silk Road: insights into the spider (Arachnida, Araneae) diversity in Georgia from the Caucasus barcode of life project. Part II. Caucasiana 2: 231–297. [& Suppl.] https://doi.org/10.3897/caucasiana.2.e110536

Seropian A, Bulbulashvili N, Makharadze G, Kovács G (2025) From burrows to spotlight: First description of the female of *Eresus lavrosii* Mcheidze, 1997 (Araneae, Eresidae), with notes on the natural history. Caucasiana 4: 1–14. https://doi.org/10.3897/caucasiana.4.e151922

Shorthouse D (2010) SimpleMappr, an online tool to produce publication-quality point maps. Accessed December 4: 2018. http://www.simplemappr.net

Thorell T (1870) On European spiders. Review of the European genera of spiders, preceded by some observations on zoological nomenclature [second part]. Nova Acta Regiae Societatis Scientiarum Upsaliensis (3) 7(II, 1): 109–242.

WSC (2025) World Spider Catalog. Version 26.0. Natural History Museum Bern. http://wsc.nmbe.ch [accessed on 02.03.2025] https://doi.org/10.24436/2

Zamani A, Altın Ç, Szűts T (2020) A black sheep in *Eresus* (Araneae: Eresidae): taxonomic notes on the ladybird spiders of Iran and Turkey, with a new species. Zootaxa 4851(3): 559–572. https://doi.org/10.11646/zootaxa.4851.3.6

Zamani A, Szabó K, Szűts T (2025) Persian treasures: integrative taxonomy reveals high species diversity of ladybird spiders (Araneae: Eresidae: *Eresus*). Zoological Journal of the Linnean Society 204 (4): zlaf086. https://doi.org/10.1093/zoolinnean/zlaf086

Zarikian NA, Zarikian AN (2022) New records of Araneae from Armenia. Indian Journal of Entomology 84(4): 757–760. https://doi.org/10.55446/IJE.2022.688

Zarikian N, Dilbaryan K, Khachatryan A, Harutyunova L (2023) Species composition and diversity of spider (Arachnida: Araneae) in the northern forests of Armenia. Biodiversity 24(1–2): 66–75. https://doi.org/10.1080/14888386.2023.2184424

Zazanashvili N, Mallon D [Eds] (2009) Status and Protection of Globally Threatened Species in the Caucasus. CEPF, WWF. Contour Ltd., Tbilisi, 232 pp.

Zhang J, Kapli P, Pavlidis P, Stamatakis A (2013) A General Species Delimitation Method with Applications to Phylogenetic Placements. Bioinformatics 29(22): 2869–2876. https://doi.org/10.1093/bioinformatics/btt499

Supplementary material 1

Sequence alignment used in the study

Authors: Alireza Zamani, Armen Seropian, Noushig Zarikian, Natalia Bulbulashvili, Tamás Szűts

Data type: pdf

Copyright notice: This dataset is made available under the Open Database License (http://opendatacommons.org/licenses/odbl/1.0/). The Open Database License (ODbL) is a license agreement intended to allow users to freely share, modify, and use this Dataset while maintaining this same freedom for others, provided that the original source and author(s) are credited.

Link: https://doi.org/10.3897/zookeys.1249.159081.suppl1